

THE
ARTIST'S ASSISTANT
IN
Drawing, Etching, Engraving,
MEZZOTINTO - SCRAPING,
PAINTING ON GLASS,
AND ON
SILKS, SATINS, &c.

AND ADAPTED TO THE CAPACITIES OF YOUNG BEGINNERS.

BY THE LATE

ROBERT LAURIE, ESQ.

THE EIGHTH EDITION, IMPROVED;

WITH THE ADDITION OF

Lithography, or the Art of Drawing on Stone.

LONDON :

PRINTED FOR R. H. LAURIE,

MAP, CHART, AND PRINT SELLER, No. 53, FLEET STREET.

1842.



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MEZZOTINTO-SCRAPING,
PAINTING ON GLASS, AND ON SILKS, SATINS, &c.

CONTAINING THE
EASIEST AND MOST COMPREHENSIVE RULES
FOR THE ATTAINMENT OF THOSE TRULY USEFUL AND POLITE ARTS,
METHODICALLY DIGESTED,
And adapted to the Capacities of Young Beginners.

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ROBERT LAURIE, Esq.

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WITH THE ADDITION OF
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PREPARATION OF THE INK, CHALKS, &c.

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P R E F A C E.

It has mostly been the misfortune of those who have professed to lay down rules for the attainment of any art or science, to leave them enveloped with difficulties, which, if not utterly insuperable, at least discourage the learner from proceeding in a study which he can have little hope will ever reward his pursuit.

Hence we may reasonably infer that the said professors were totally unacquainted, if not with the theory, at least with the practical part of what they undertook to teach others; and that the instructions they have given were founded rather upon a bare supposition of their efficacy, than upon the surer basis of long and repeated experience, which alone could have insured their success, and from which, with all due deference to the judicious, whose sanction we shall at all times be ambitious to deserve, we may venture to answer for the practicability of our own.

To obviate objection, and to remove those difficulties which had so long blocked up the path of science, and retarded if not wholly impeded the pupil in his progress to the temple of Fame, was the chief intention in compiling the subsequent little treatise.

Over and above the improvements made in illustrating the several arts hitherto so imperfectly and unintelligibly explained, we have introduced directions for Scraping in Mezzotinto, which, in this edition, are still further enlarged, and which, we flatter ourselves, will be the more acceptable, when it shall appear, from the rules laid down

for the performance of this art, that it is so easy to be attained, that a tolerable proficiency in Drawing will enable any one to undertake it with all imaginable prospect of success.

As the book is intended chiefly for the use of young practitioners, we have purposely avoided all abstruse expressions and obsolete terms, contenting ourselves with that familiar style which we judged most likely to inform those minds we would wish to improve: yet, as the ideas of an artist are not wholly to be conveyed without some necessary terms peculiar to each branch, we have taken care to explain such as could not be omitted without manifest injury to the work, by familiar words of a synonymous tendency, wherever they occur; so that we apprehend we have not left any impediment for the reader to encounter.

To this edition is now, for the first time, added, the Art of *Drawing on Stone*, which has been brought to such perfection, that it may justly be esteemed one of the most useful discoveries in art of modern times: and, when taking into consideration the accuracy with which every line, every touch, and the nice gradations of tint, produced by the hand of the artist, can be multiplied with facility, it must be acknowledged, in those respects, to surpass any graphic invention prior to its discovery. Another important feature, connected particularly with the execution, is, that the process is such, that any person, capable of drawing, may, with a moderate degree of care, make a drawing on stone, with almost as much expedition, and as much certainty, as a similar drawing in pencil or chalk could be executed on paper. In this respect it takes precedence of every mode of engraving hitherto practised.

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THE ARTIST'S ASSISTANT.

CHAPTER I.

OF DRAWING.

DRAWING is the art of representing by outlines and shadows the various productions of Nature and Art, and of enlarging and contracting objects in the most exact proportion.

This art recalls to our memory things long since past, and rescues from oblivion the deeds of our illustrious ancestors, at the same time that it revives their image in our mind, by preserving their features for many generations. In a word, it may be said to be the silent, but most expressive, language of nature, which speaks to the eye, is understood by all nations, and conveys an idea where even words themselves would prove deficient.

After giving some general directions for the attainment of this truly polite and rational amusement, which is the basis on which all the rest of the arts depend, we shall consider it more particularly under the following heads, and lay down the most copious and intelligible rules for each respectively, viz. :

<i>Copying of Draughts,</i>	<i>Drapery,</i>
<i>Enlarging and Contracting,</i>	<i>Landscape,</i>
<i>Imitation of Life,</i>	<i>Light and Shadow,</i>
<i>History.</i>	

The implements necessary for drawing, are, a ruler, compasses, charcoal, a black-lead pencil, penknife, port-crayons, black, white, and red, chalk, crayons, Indian ink, crow-quill pens, camel's-hair pencils, fitches, paper of several sorts, and portfolios.

General Rules for Drawing.

The first thing to be observed is the choice of proper originals; and here we would recommend Le Clerc's Principles of Drawing as the easiest and best calculated for the instruction of beginners. This may be had, price 3s. at the Publisher's of this work.

Having provided this, begin with the outlines of the several features, as the eyes, nose, mouth, ears, &c. as they occur in the book. Practise these often over, till you are quite master of them; then proceed to a profile or side face, after that to an oval or full face; always remembering that each of these must be perfectly attained before you venture to proceed further.

When you can copy a face correctly, the next thing is, to draw the several limbs or parts of the body, as the hands, arms, feet, legs, &c. then go on to the body itself; which having done, you will be able to undertake a whole figure, observing carefully the exact proportions and bearings of one part with respect to the other.

The learner ought to be particularly cautious that he do not attempt a whole figure before he has made himself master of the several parts: for this is beginning the work at the wrong end, and is indeed the same thing as if a man should attempt to climb to the top of a house without the help of the stairs.

As for beasts, birds, fruit, plants, &c. we deem it useless to give directions for drawing them, as it is well known, that he who has so far improved his ideas as to be able to draw a human figure correctly, will find it no difficulty to perform every other branch of this art.

Sketch or draw all your outlines faintly, with a piece of soft charcoal (which may be known by the pith in the middle) cut to a point like a pencil; and when you see any thing amiss, whisk it out with a handkerchief or feather, correct your errors with a black-lead pencil, and compare your work with the original, till every part of them perfectly correspond. This done, finish your outlines with black lead or Indian ink. This advice, properly attended to, will save you an infinite deal of trouble, in drawing over and over again, to your no small discouragement.

If you prefer Indian ink, rub it with water upon a marble, and with a crow-quill pen perfect your outlines; then rub out the marks of the pencil with bread.—Keep three or four different shades of ink in the hollows of your stone, to distinguish your distances, reserving one of the holes for water.

When you are thoroughly versed in the outlines, your next business will be to learn to shadow: but of this hereafter, under the articles of *Light and Shade*.

Be not too hasty at first setting out, which will but impede your progress, and hinder your improvement; whereas, by bestowing a little more time, you will attain perfection sooner than you can well imagine, and expedition will come of itself as you become more experienced.

Of Copying of Draughts.

When you would copy a print or drawing exactly of the same size, rub the back of it with the dust of red chalk or black lead;

lay this upon your paper, and pin it down at the four corners; then with a blunt point trace the outlines and breadths of the shadows, which done, having carefully examined it, to see that nothing be omitted, take it off, and finish it with the pencil or pen.

Another way to make an exact copy, and at the same time to preserve the original, is to lay a piece of transparent paper upon it, and draw the outlines thereon with a black-lead pencil; then between that and the paper you intend to draw upon, place a piece of thin post paper, reddened or blackened at the back; after which, proceed to trace and finish it according to the foregoing rule.

If you would reverse your original, you need only turn the transparent paper, with the drawing you have made upon it, downward upon the post paper, and trace it as above directed.

Of Enlarging and Contracting.

Divide your original with a pair of compasses into any number of squares, and rule them across with a black-lead pencil from side to side, and from top to bottom.

Then, having your paper of the size you intend, divide it into the same number of squares, either bigger or less, as you would enlarge or contract it.

Place your original before you, and draw square by square the several parts; observing to make the part you are drawing fall into the same part of the square as it does in your original. To prevent mistakes, number the squares both of the original and copy, as in Fig. I. and II. of the Drawing-plate.

Then outline it with Indian ink, rub out the marks of the pencil with bread, and shade it at pleasure.

Of Imitation of Life.

Let the person you draw after be of a proportionable size, and well shaped; place him in the easiest and most natural attitude; then sketch faintly with your charcoal the head, or any of the limbs separately; which having carefully done, proceed to finish with your pencil.

When you have sufficiently practised the several parts or limbs, you may draw the whole figure, in whatever attitude you think proper to place it; beginning with the easiest, and proceeding by degrees to the more difficult postures, as time and experience shall enable you.

Be sure to finish your outline so correctly, (marking all the muscles as they occur) that, even before you give it any shadow, it may have some resemblance of the person.

The true proportion which one part of a human figure bears to another, may be seen in Fig. III. which will serve as a

standard to examine your drawing by; except where the figure is to be fore-shortened, in which case Nature will be the best guide.

In drawing a likeness, care must be taken to express the passions in the most lively manner; which is to be done by observing the peculiar cast and disposition of every feature with the exactest nicety: and as this is, of all the parts of drawing, by far the most difficult, it will require a more than ordinary attention, and should be last attempted.

Of Drapery.

Drapery is the art of clothing your figures with elegance and propriety.

When your naked figure is outlined, first draw the outlines of the drapery lightly, then the greater folds, and afterward the lesser; observing never to let them cross each other.

Particular regard is to be had to the quality of the drapery; as the folds of stuff or woollen cloth are more abrupt and harsh, and those of silk more flowing and easy. Linen, cambric, gauze, &c. as their substance is lighter than either, require a still greater delicacy in expressing the waving of the folds, by the faintness of their shadows.

The drapery should not stick too close to the body, but must seem to flow round as it were; yet in such a manner, as that the motion of the figure may be free and easy. A great lightness and motion of the drapery should only be used, when the figures are supposed to be in much agitation, or exposed to the wind; but in a calm place, and free from violent action, their drapery should be large and flowing, in order to give them a more graceful appearance.

Let the loose parts of the drapery blown by the wind all flow one way: and draw that part which lies closest to the body, before you draw those which fly off.

Suit your garments to the body, and make them bend with it: the closer the garment sticks to the body, the narrower and smaller must be the folds; and if it sits quite close, there will be no folds at all, but must only have a faint shadow, to represent the part of the body which lies under it.

By observing diligently in what manner the drapery flows upon any person standing or sitting before you for that purpose, you will see in what manner to dispose your folds and shadows, according to the unerring rule of nature.

Of Landscape.

Landscape represents the face of the country as it appears to our view, with all the various objects analogous thereto; as towns, castles, churches, houses, trees, hills, cattle, rivers, rocks, ruins, &c.

Be careful to augment or lessen every object according to its

distance, making the most remote objects fainter and less distinct, as they appear to the eye, and enlarging them proportionably as they advance nearer.

Show the sky cloudy, or clear, as occasion requires; and if you introduce the sun, let it be rising or setting; either of which representations will give an additional grace to your picture, as they represent nature in its liveliest and most agreeable appearance.

Adapt every part of your landscape to the season of the year, and the time of the day, you intend it to represent; and dispose your lights and shades with consistent propriety.

Lastly, we would recommend it to practitioners in this noble art, to rise early in a fine morning, that they may have a better idea of the harmony and beauty of the works of the great Creator; which would wonderfully replenish their minds, as to colour and effect.

Of Light and Shade.

The true distribution of light and shade in a picture is absolutely necessary to be known; as it not only determines the proper distance of one object from another, without which the whole would be an undistinguishable mass of confusion; but it gives likewise to each respective object its substance, roundness, and effect.

Shadowing is performed with the pen or pencil; in either of which great judgement is required.

Having made your outlines correct, the first thing is to observe from which side of the original the light comes in; which, if natural, is either from the right hand or left; for whenever the light appears in the middle of a picture, and seems to glare more than ordinary, it is caused by a candle, a lamp, or some other luminous body, and is called an artificial light.

Lay on your little tints first, disposing them as you see they are done in the original; and then proceed to the deeper ones, till you come to the darkest parts of all: for you may at any time darken your shadows, when you cannot lighten them.

Let all your shadows in the same piece fall on the same side; that is, if the right side of a man's face be dark, so must be the right side of his body, arm, leg, thigh, &c. But if the light side be darkened by the opposition of some other body intercepting the light, it must receive a contrary shadow.

Make your shadows fainter as they grow toward the light, breaking them gradually, that they may not appear too sudden or harsh.

If you shade with black lead or with crayons, you may blend your shadows, and soften them one into another as you require, with a stump made of paper or glove leather rolled and tied hard, and cut almost to the point, with which you may also weaken your shades where they are too strong.

When one part of the body projects over or before another, the part projecting must receive a stronger light: those parts that bend inward must be made so much the darker, and shadowed deepest next the light.

Two equal lights must never be made in the same picture: the strongest light should fall on the middle of the piece, (where the principal figures ought to stand) diminishing gradually toward the extremities.

By frequently examining into nature, you will have an opportunity of improving your ideas of light and shade, and will be enabled to form a proper judgement of the effect which the different rays or degrees of light will produce in a picture; for which reason you should never let slip an opportunity of remarking the various appearances you meet with.

Of History.

This branch of drawing presents to our view things past, present, and future.

An historical picture must describe the transaction represented, in a manner so clear and conspicuous, as to convey an idea of it to our minds, as fully as could be done by a verbal description: and care must be taken to preserve such an analogy or connexion between the figures, that not one may seem to be introduced but for some end or purpose. And as, in dramatic writing, it is essential to make every person *speak* consistently with the part he represents, so here it will be equally necessary to observe the same propriety of character, and make every figure *look* the sentiment it is intended to express.

CHAPTER II.

OF ETCHING.

ETCHING is a method of working on copper, wherein the lines or strokes, instead of being cut with a graver, are eaten with aqua fortis.

This art, being executed with greater ease and freedom than engraving, represents curious subjects better, and more agreeably to nature; as landscapes, ruins, and small, faint, or remote objects, buildings, &c.

The principal materials for this art are, the plate, hard and soft ground, (the first for winter, and the other for summer,) a dabber, turpentine varnish, lamp-black, soft wax, and aqua fortis.

The tools are, an oil-rubber, a burnisher, a scraper, a hand-vice, etching-boards, etching-needles, an oil-stone, and a parallel ruler.

The plate may be had of any size, and well polished, fit for use, of the copper-smiths in London.

Directions for laying the Ground.

Having provided yourself with a plate of the size of the print or drawing you intend to copy, rub it well with an oil-rubber made of swan-skin flannel, till all the marks of the charcoal used in polishing it, entirely disappear; then, wiping off the dirty oil with a linen rag, dip your finger in some clean oil, and touch it over every part of the plate; after which, with your burnisher polish the plate, till you can see your face in it; and in case any sand-holes or flaws appear, the scraper will assist you in taking them out. The marks left by the scraper are to be taken out by the burnisher, till nothing appear. Having fixed your hand-vice at one end of the plate, with a rag and whiting clear the plate carefully from grease; then heat it over a charcoal fire, or lighted paper, till it will melt the ground, which is to be laid on thinly, and dabbed all over with the dabber, till it is perfectly smooth and even; then warm the plate again, and holding it up with the ground downward, smoke it all over with a large candle, taking care that the snuff of it do not touch the ground, and waving the candle continually over every part, so that the ground may not be burnt by heating it more in one place than another. If the plate be large, you may bind four penny candles together.

Directions for Tracing.

The first thing to be done, (while the plate is cooling, after the ground is laid,) is to rub the back of your print or drawing all over with a bit of rag or cotton, dipped in the scrapings of red chalk, and shake off the loose dust, or wipe it off gently with a clean rag. Place the red side upon the plate, making it fast at each corner with a little bit of soft wax. Lay your etching-board under your hand, to prevent bruising the ground; then, with a blunt etching-needle trace lightly the outlines and breadths of the shadows, till the marks of them appear upon the ground, which you must take care not to penetrate by tracing too hard.

As great nicety is required in this part of your work, it will be necessary now and then to lift up one corner of your original, and examine whether every part be traced before you take it off, as it will be extremely difficult to lay it down again in its former position.

Directions for Etching.

Having carefully traced your original, take it off, and lay a silk or linen handkerchief next the plate, and over that your etching-board: then proceed to the etching; for which observe the following directions, which are adapted to every particular branch, as landscapes, shipping, portraits, history, architecture, &c.

Distances in landscapes, or the faint parts of any other picture, are the first to be done; and these are to be worked closer, and with a sharper-pointed needle: the darker parts must be etched wider, and with a blunter needle; but, to prevent mistakes, the needles may be marked, according to their different degrees, and the uses for which they are intended. As for the very faintest parts of all, they are to be left for the graver, or dry needle; of which hereafter.

In building, and all architecture in general, use a parallel ruler, till frequent practice enables you to do them well enough without.

The needles may, when necessary, be whetted upon your oil-stone, keeping them turning in your hand, so as to wet them equally all round. The oil-stone will be further useful in whetting the scraper, which is to be rubbed flat upon the stone, and with a steady hand, keeping oil constantly upon the stone.

Of Biting, or eating in the Work with Aqua Fortis.

First examine your work carefully, to see that nothing be omitted; and if any scratches appear upon the ground, or mistakes be committed in the etchings, they are to be stopped out, which is done by covering them with a mixture of lamp-black and varnish, laid on thinly with a hair pencil, which, when dry, will resist the aqua fortis. But it will be best to stop out these, as they occur to you in the course of your work; for by this means they will be less liable to escape your notice; and when the varnish is dry, you may etch over it again, if required.

The next thing is, to enclose the work with a rim or border of soft green or other coloured wax, about half an inch high, bending the wax in the form of a spout at one corner, to pour off the aqua fortis: and that it may not run out at any other part, take care to lay your wax so close to the plate, that no vacancies be left.

Your aqua fortis must be single; and if too strong, as will be seen in the biting, take it off, and mix it with a little water, shaking them together in a bottle; and when, by often using, it becomes too weak, it may be strengthened by mixing it in a bottle with a little double aqua fortis. The bottle which contains the aqua fortis should have a large mouth, and a glass stopple.

Let the aqua fortis lie on the plate a short time, wiping off the bubbles, as they arise, with a feather, which may remain upon the plate while it is biting; after which, take it off, and wash the plate with water; then let it dry; and by scraping off part of the ground from the faintest part of the work, try if it be bit enough; and if not, stop out the part you have tried with the lamp-black and varnish; and when that is dry, pour on the aqua fortis again.

When the faint parts of your work are bit enough, stop them out, and proceed to bite the stronger parts, stopping them out as occasion requires, till the whole work is sufficiently bit: then

warm the plate, and take off the soft wax; after which, heat the plate till the ground melts, pour on a little oil, and wipe the whole off with a rag. When the ground is taken off, rub the work well with the oil-rubber, and wipe the plate clean; then proceed to finish it with the graver, according to the following directions.

CHAPTER III.

OF ENGRAVING.

THE tools necessary for engraving are, the oil-rubber, burnisher, scraper, oil-stone, needles, and ruler, already mentioned to be used in etching; also gravers, compasses, and a sand-bag.

Gravers are of two sorts, square and lozenge. Three of each sort should be provided. The first is used in cutting the broader strokes, the other for the fainter and more delicate. No graver should exceed the length of five inches and a half, the handle included, excepting for straight lines.

The sand-bag, or cushion, is used to lay the plate on, for the conveniency of turning it about. The oil-stone must be of the Turkey sort.

Of whetting and tempering the Graver.

As great pains are required to whet the graver nicely, particularly the belly of it, care must be taken to lay the two angles of the graver, which are to be held next the plate, flat upon the stone, and rub them steadily till they are polished like a mirror, and till the belly rises *gradually* above the plate, so as that, when you lay the graver flat upon it, you may just perceive the light under the point; otherwise it will dig into the copper, and it will be impossible to keep a point, or execute the work with freedom. In order to this, keep your right arm close to your side, and place the fore-finger of your left hand upon that part of the graver which lies uppermost on the stone. When this is done, in order to whet the face, place the flat part of the handle in the hollow of your hand, with the belly of the graver upward, upon a moderate slope, and rub the extremity or face upon the stone, till it has an exceeding sharp point, which you may try upon your thumb-nail. The oil-stone, while in use, must never be kept without oil.

When the graver is too hard, as is usually the case when first bought, and may be known by the frequent breaking of the point, the method of tempering the steel is as follows:—

Heat a poker red-hot, and hold the graver upon it within half an inch of the point, waving it to and fro till the steel changes

to a light straw colour; then put the point into oil to cool; or hold the graver close to the flame of a candle, till it be of the same colour, and cool it in the tallow: but be careful either way not to hold it too long, for then it will be too soft; and in this case the point, which will then turn blue, must be broken off, and whetted afresh, and tempered again, if required. But be not too hasty in tempering; for sometimes a little whetting will bring it to a good condition.

Of holding the Graver.

Cut off that part of the handle which is upon the same line with the belly, or sharp edge of the graver, making that side flat, that it may be no obstruction.

Hold the handle in the hollow of your hand; and extending your fore-finger toward the point, let it rest upon the back of the graver, that you may guide it flat, and parallel with the plate.

Take care that your fingers do not interpose between the plate and the graver; for they will prevent you from carrying the graver level with the plate, and from cutting your strokes so clean as they ought to be.

Directions for Engraving.

Let the table or board you work at be firm and steady; upon which place your sand-bag, with the plate upon it, and holding the graver as above directed, proceed to business in the following manner.

For straight strokes, hold your plate firm upon the sand-bag with your left hand, moving your right hand forward; leaning lighter where the stroke should be fine, and harder where you would have it broader.

For circular or crooked strokes, hold the graver stedfast, moving your hand or the plate, as you see convenient.

Learn to carry your hand with such a sleight, that you may end your stroke as finely as you began it; and, if you have occasion to make one part deeper or blacker than another, do it by degrees: and that you may do it with greater exactness, take care that your strokes be not too close, nor too wide.

In the course of your work, scrape off the barb or roughness which arises, with the belly of your graver; but be careful, in doing this, not to scratch the plate: and that you may see your work properly as you go on, rub it with the oil-rubber, and wipe the plate clean, which will take off the glare of the copper, and show what you have done to the best advantage.

Any mistakes or scratches in the plate may be rubbed out with the burnisher, and the part levelled with the scraper, polishing it again afterward lightly with the burnisher.

Having thus attained the use of the graver, according to the foregoing rules, you will be able to finish the piece you had etched, by graving up the several parts to the colour of the original, beginning, as in the etching, with the fainter parts, and advancing gradually with the stronger, till the whole is completed.

The dry needle, (so called because not used till the ground is taken off the plate,) is principally employed in the extreme light parts of water, sky, drapery, architecture, &c.

For your first practice, copy such prints as are openly shaded; the more finished ones being too difficult, till you have gained further experience.

N. B. To prevent any obstruction from too great a degree of light, we would recommend the use of a sash, made of transparent or fan paper, pasted on a frame, and placed sloping at a convenient distance between your work and the light. This will not only preserve the sight, but, when the sun shines, cannot possibly be dispensed with.

CHAPTER IV.

OF MEZZOTINTO-SCRAPING.

THIS art is recommended to the practice of the ingenious reader, for the amazing ease with which it is executed, especially by those who have any notion of drawing.*

Mezzotinto prints are those which have no hatching or strokes of the graver, but whose lights and shades are blended together, and appear like a drawing of Indian ink.

The tools used in this art are—

The copper-plate, oil-stone, grounding-tools, scrapers, burnisher, and needles.

Directions for laying the Mezzotinto-Ground.

Mark off upon the bottom of the plate the distance you intend to leave for the writing, coat of arms, &c.; then laying your plate, with a piece of swanskin flannel under it, upon your table, hold the grounding-tool in your hand perpendicularly, lean upon

* The first mezzotinto known, erroneously ascribed to Prince Rupert, is a portrait of the Queen of France, inscribed "*W. Hondthurst, pinxit, L. Siegen inventor, fecit, anno 1643.*"—*Athenæum*, 1836, page 288.

it moderately hard, continually rocking your hand in a right line from end to end, till you have wholly covered the plate in one direction : next cross the strokes from side to side, afterward from corner to corner, working the tool each time all over the plate, in every direction, almost like the points of a compass ; taking all possible care not to let the tool cut (in one direction) twice in a place. This done, the plate will be full, or, in other words, all over rough alike, and would, if it were printed, appear completely black.

Having laid the ground, take the scrapings of black chalk, and with a piece of rag rub it over the plate : or you may, with two or three candles, smoke it, as before directed for etching.

Now, take your print or drawing, and having rubbed the back with red-chalk dust, mixed with white lake, proceed to trace it, as directed page 13.

Directions for whetting the Grounding-Tool.

If a tooth of the tool should break, it may be perceived in the working by a particular streak or gap, which will appear in the ground in a straight line ; in which case the tool must be whetted on the back, holding it sloping, and in a circular manner, like the bottom of the tool.

Directions for scraping the Picture.

Take a blunt needle, and mark the outlines only ; then with a scraper scrape off the lights in every part of the plate, as clean and smooth as possible, in proportion to the strength of the lights in your picture, taking care not to hurt your outlines : and that you may the better see what you do, with the thumb and forefinger of the left hand hold a piece of transparent paper, sloping, just over your right hand, and you will soon be a judge of the different teints of the work you are doing ; scraping off more or less of the ground, as the different strengths of light and teints require.

The use of the burnisher is, to soften or rub down the extreme light parts after the scraper is done with, such as the tip of the nose, forehead, linen, &c., which might otherwise, when proved, appear rather misty than clear.

Another method, used by mezzotinto scrapers, is, to etch the outlines of the original, as also of the folds in drapery, marking the breadth of the shadows by dots, which having bit of a proper colour with aqua fortis, according to the directions given, page 14, take off the ground used in etching, and, having laid the mezzotinto-ground, as above, proceed to scrape the picture.

Four or five days before you think the plate will be ready for proving, notice must be given to the rolling-press printer to wet some French paper, as no other will do so well for this work, and

as that time is necessary for it to lie in wet. When the proof is dry, touch it with white chalk, where it should be lighter; and with black chalk, where it should be darker: and when the print is re-touched, proceed as before for the lights, and for the shades use a small grounding-tool, as much as you judge necessary to bring it to the proper colour; and when you have done as much as you think expedient, prove it again, and so proceed to prove and touch, till it is entirely to your mind. When the plate tarnishes in the part where you are at work, a little vinegar and salt kept by you in a phial will take it off, wiping it dry with a clean rag.

Avoid as much as possible over-scraping any part before the first proving, as by this caution the work will appear the more elegant.

CHAPTER V.

OF PAINTING UPON GLASS.

PAINTING upon GLASS is an art which has generally appeared difficult; yet no representation can be more elegant than that of a picture done well in this manner: for it gives all the softness that can be desired in a picture, and is easy to work; as there are no outlines to draw, nor any shade to make, but the colours are put on without the trouble of either.

The pictures are those done in mezzotinto; for their shades being rubbed down on the glass, the several lines which represent the shady part of any common print are by this means blended together, and appear as soft and united as in any drawing of Indian ink.

Provide such mezzotintos as you like; cut off the margin; then get a piece of fine crown glass, the size of your print, (as flat and free from knots or scratches as possible,) clean the glass, and lay some Venice turpentine, quite thin and smooth, on one side thereof, with a brush of hog's-hair. Lay the print flat in water, and let it remain on the surface till it sinks; it is then enough: take it carefully out, and dab it between some papers, that no water may be seen, yet so as to be damp.

Next, lay the damp print, with its face uppermost, upon a flat table; then, holding the glass over it, without touching the turpentine till it is exactly even with the print, let it fall gently on it. Press the glass down carefully with your fingers in several parts, so that the turpentine may stick to the print; after which, take it up; then, holding the glass toward you,

press the print with your fingers, from the centre toward the edges, till there be no blisters remaining.

When this is done, wet the back of your print with a sponge, till the paper will rub off with your fingers; then rub it gently, and the white paper will roll off, leaving the impression only upon the glass: then let it dry, and with a camel's-hair pencil, dipped in oil of turpentine, wet it all over, and it will be perfectly transparent and fit for painting.

Colours proper for Painting upon Glass.

The several sorts of colours ground in oil for this purpose, and tied up in little bladders, may be had at all the capital colour-shops in London, &c.

Whites.

Flake White.
Podium.

Blacks.

Lamp-Black.
Ivory-Black.

Browns.

Spanish Brown.
Umber.

Blues.

Blue Bice.
Prussian Blue.
Saunder's Blue.
Smalt.

Reds.

Rose-Pink.
Vermilion.
Red-Lead.
Indian Red.
Lake Cinnabar.

Yellows.

English Pink.
Masticot.
English Oker.
Spruce Oker.
Dutch Pink.
Orpiment.

Greens.

Verdigris.
Terra Vert.
Verditer.

The ultramarine (for blue), and the carmine (for red), are rather to be bought in powders, as in that case they are less apt to dry, or be lost: and as the least touch of these will give the picture a cast, mix up what you want for present use with a drop or two of nut-oil upon your pallet, with your pallet knife.

The pallets and knives may be had at most of the colour shops and ivory turners.

To get the colour out of the bladders, prick a hole at the bottom of each, and press it till you have enough upon your pallet for present use; because the colours are apt to dry and skin over.

Then lay a sheet of white paper on the table, and taking the picture in your left hand, with the turpentine side next you, hold it sloping (the bottom resting on the white paper), and all the outlines and tints of the print will be seen on the glass; and nothing remains but to lay on the colours proper for the different parts, as follows.

The METHOD of using the COLOURS.

As the lights and shades of your picture open, lay the lighter colours first on the lighter parts of your print, and the darker over the shaded parts; and having once laid on the brighter colours, it is not material if the darker sorts are laid a little over them; for the first colour will hide those laid on afterwards. As for example.

Reds.

Lay on first the red lead, and shade with lake or carmine.

Yellows.

The lightest yellow laid on first, may be shaded with Dutch pink.

Blues.

Blue bice or ultramarine, used for the lights, may be shaded with indigo.

Greens.

Lay on verdigris first, and then a mixture of that and Dutch pink. This green may be lightened by an addition of Dutch pink.

When any of these colours are too strong, they may be lightened to any degree, by mixing white with them upon your pallet; or you may darken them as much as you please, by mixing them with a deeper shade of the same colour.

The colours must not be laid on too thick; but if troublesome, thin them before you use them, with a little turpentine oil.

Take care to have a pencil for each colour; and never use that which you have used for green with any other colour, without first washing it well with turpentine oil, as that colour is apt to appear predominant when the colours are dry.

Wash all the pencils, after using, in turpentine oil.

Your glass, when painted, must stand three or four days free from dust, before it be framed.

All sorts of mezzotinto and other prints proper for painting on glass, may be had at the various publishers.

MAGIC LANTERNS, &c.—The figures on the glass slides of Magic Lanterns are painted with *transparent* colours, mixed with turpentine varnish.

CHAPTER VI.

PAINTING ON SILKS, SATINS, &c.

WHEN the outline is made according to the artist's fancy, a wash of isinglass should with care be laid on, to take away the glare and sleekness of the satin; otherwise the colours will not work freely: the isinglass to be melted in very clear water, over the fire, so as not to be very glutinous; otherwise it will discolour the satin, and consequently spoil the colours.

In the foregoing rules we have recommended, for the most part, the leaving the paper for the light parts of a flower, and working with colours mostly transparent; but here the lights are to be made by a small tincture of the colour of the intended flower mixed with the flake white, so much as just to make a degree from the colour of the satin; if white, or of any other colour, to be mixed proportionably to the colour of the flower: for instance, if a blue flower, the bice or verditer, a very small quantity of it with the white, using less of it proportionally as the shades grow darker; and in the most dark, indigo alone may be used, it being by that time rendered opaque enough; but great care must be used not to lay the colours on too thick, otherwise they will crack: a little white sugar candy will be found necessary, when mixed with the gum water, as a preventive to that inconvenience. If a flower happens to be of so deep a colour as not to admit of any pure white in the lightest of the parts, a sort of priming of white should be laid on; after which, when dry, begin with the ground colour of the flower, proceeding gradually with the shades, as in the above directions, which, with the selected examples we have annexed, peculiarly chosen from nature for the purpose, we hope will be sufficient for our ingenious students in this most delightful amusement.

CHAPTER VII.

LITHOGRAPHY; OR, THE ART OF DRAWING
ON STONE.*The Principles of Lithography.*

As this little work may be addressed to many that are not conversant with the typographic art, at the expense of appearing prolix, we will enter into a few details which may simplify the subsequent description.

The ordinary process of printing is of two kinds. One, as in copper-plate, is from lines cut *into* the body of the plate, which are filled up with the printing ink; and the other, as in letter-press, the lines and letters are *raised*, and the ink is applied to these prominences.

Lithographic printing differs from both of these. In this the lines to be printed and the rest of the surface are on the same level; and its peculiarity consists in the process by which a roller covered with ink, being passed over the prepared surface of the stone, leaves the ink only on the writing or drawing. The impression is taken from the stone by its being drawn under the edge of a wooden scraper pressed heavily down when the paper is laid on it. The properties of the lithographic stone will best explain the nature of the art.

The stone used, though hard, is of a chalky nature. It readily splits into slabs of even thickness, and to its absorbent properties it owes its fitness for the purpose of the lithographer. It readily imbibes water or any other liquid, and is very tenacious of grease. As grease and water will not mix, this is taken advantage of in lithography. If the polished or even surface of a lithographic stone be wetted by a sponge or other means, it will absorb a small portion of the water into its substance. If then a roller covered with lithographic printing ink, which is of a greasy nature, be passed over this moistened surface, it is evident that none of this greasy ink will adhere to it; and, consequently, there will be no visible effect.

But if the surface of the stone had been quite *dry*, it would have become entirely blackened by the greasy inked roller passing over it, as it is the property of the stone to absorb grease as readily as it does water.

Now, if we had made any marks upon the *dry* stone with a greasy substance, say the end of a tallow candle, and then have wetted the whole surface with water, although there would be scarcely any visible mark on it, yet the water will not have penetrated the stone where the greasy marks had been made. Now, if the inked roller is passed over the stone thus marked and wetted, the ink will adhere only to those parts which had been marked with the grease prior to its having been wetted.

If a sheet of paper is laid on this surface and then subjected to pressure, we shall obtain an impression of these grease marks, blackened by the inked roller.

The principle of the lithographic art consists, then, in drawing on this absorbent surface with a greasy substance, which is blackened in order to render it visible while using, but which blackness is no essential part of its operation, merely serving the artist as a measure of the quantity of grease he applies to his work, and then printing from this grease delineation by wetting and otherwise preparing the stone, by means of a roller thinly covered with greasy printing ink.

There are several methods of practising lithography, but the principal are the chalk method and ink lithography. We will describe both of these.

I. CHALK LITHOGRAPHY.

Tracing.

The drawing must be traced upon French tracing-paper, (which may be procured at Ackermann's, in the Strand,) with pen and ink, or with a pencil. Tracing-paper that has been made from ordinary tissue paper will generally not do, as it is most commonly prepared with some composition of oil, wax, or other greasy matter, which renders it unfit for the purposes of lithography.

To make use of this tracing the best mode is to have a piece of tissue paper, somewhat smaller than your tracing, and upon one side of which some powdered red chalk, or black lead, has

been rubbed, which may be done with a piece of cotton-wool, until it is evenly and fully covered all over. Red chalk is the best in most cases. By means of this piece of red or black paper, (from which any grease must be carefully kept,) the tracing may be transferred to the stone.

The Stone.

This, as before stated, is generally procured from the printer, properly prepared for the desired subject. For chalk drawings, the surface of it, after being rendered perfectly even and level, which is done by rubbing the faces of two stones together, is grained or roughened by the same means, and the addition of silver or other sand, of different degrees of fineness, according to what is required. The stone thus grained is eminently susceptible of any touch, and will imbibe any moisture or grease, and, therefore, should be carefully preserved from being touched, or otherwise injured.

The stone being thus prepared, the tracing must be laid, the *face downwards*, upon it, with the piece of reddened or blackened paper placed under it, the prepared side upon the stone, and the edges of the tracing secured with gum-water or wafers; taking great care, however, that none of these come within the margin of the work; as, where the gum, &c., should touch, the drawing cannot be made over.

The tracing being fixed down, the lines of the tracing must be gone over with a tolerably sharp steel point. This will cause the chalk, or black lead, on the paper underneath, to be transferred, wherever it is touched by the point, to the surface of the stone, and thus afford the necessary guide for the future drawing. The amount of pressure upon the steel point must be left to practice. It is soon ascertained, prior to commencing, by trying a piece on the edge of the stone, bearing in mind that it should not be too strong, more particularly with black lead, as that is apt to prevent the lithographic chalk from working over it if too full.

As it is necessary, throughout the whole process, that the hand should not rest on the stone; as in tracing, if this be done, the impression of the hand, also, would necessarily be transferred by the red paper to the stone; there should be some means employed to obviate this.

The Chalk.

Lithographic chalk is made into the same form as ordinary crayons, but is of a greasy nature, and varies very considerably in its qualities. It is not advisable for the artist to attempt the manufacture of it, as the quantity he will use himself is so small, that the time lost, and the great uncertainty of the result, renders it a waste of time and material. The best mode of procuring them is from the lithographic printers, and especially from where the stone is to be printed, or from the artists' colourmen. The charge usually is two shillings a dozen; or, if by weight, the chalk being very light, from thirty to forty shillings per pound.

However, as it may be a matter of curiosity, and some may wish to experimentalize upon the manufacture, we will subjoin some of the receipts given by Senefelder.

Wax	.	.	.	.	4 parts, by weight.
Soap	.	.	.	.	6 "
Lampblack	.	.	.	.	2 "

The wax and soap must be melted together, then add the lampblack; rub it all well down on a hot iron plate; then put it in a vessel over the fire, till it is once more in a liquid state: then pour it on a stone, wet with linseed oil, and form a cake one-eighth of an inch thick, and cut it into strips when cold.

Another. Wax	.	.	.	.	8 parts, by weight.
Soap	.	.	.	.	4 "
Lampblack	.	.	.	.	2 "

The wax is first burned till reduced to about one-half, then the soap is melted with it, and then as above.

There is one observation which it is necessary to make respecting the crayons. The same maker's chalk should always be used in the same drawing, as the quantity or intensity of the black in its composition, which merely serves as an indication of the quantity of greasy matter applied to the stone, may vary in different receipts, and consequently the drawing, though it may appear quite in keeping on the stone, yet the process of "rolling up," preparatory to printing, may produce a very different effect, from the variation in the intensity of the colour of the crayons employed.

As the chalk, from having an alkali in the soap in its composi-

tion, absorbs moisture from the air, it will deteriorate by exposure; it should therefore be kept in a well-corked bottled, or otherwise excluded from the action of the atmosphere.

In pointing the chalk, a very sharp knife is necessary; and, as it is very brittle, it will be difficult to obtain a sharp point, except by cutting from the point towards the handle. In using the chalk the point is soon lost, and it may be renovated easily a few times by gently rubbing the sides of the crayon on a piece of paper.

For holding the crayon, there are several methods, each preferred by different artists, or for different styles. The ordinary brass or steel crayon may be used; but, as it is heavy and inflexible, it is not so well adapted for lithography as for ordinary chalk drawing.

A small stiff paper tube is one of the best holders, and is generally supplied with the chalk, which is made to fit it. This answers for most purposes. A swan-quill is a very excellent holder, as is one made of cork. A strip of cork sufficiently long, and split up some distance at one end, and in this split end a groove cut to hold the crayon, which is then tied into the split, forms a very good elastic and flexible holder for working light tints. But the artist may choose his own mode of working; practice will dictate what is best.

Precautions.

The stone, as before stated, is highly susceptible of any impression, and anything which affects its surface must, therefore, impair the effect of the drawing. It is not necessary that these accidents should be visible before it is prepared for printing, but they may occur and not be suspected until that process adds colour to these defects, or they prevent the chalk or ink from taking proper hold on the stone.

Touching the stone with the hand is carefully to be avoided, more particularly if it should be warm: for the perspiration on the surface of the skin being of a greasy nature, although almost insensibly so by any other test, will cause a distinct impression of such finger-marks to be printed; or, if it should not be so powerful as this, it will cause a dirty mark in the print. The utility of a bridge, or board, for supporting the hand off the stone,

therefore, becomes obvious, and it will be almost impossible to work satisfactorily without such aid.

Another caution is necessary during the operation of drawing : not to let the breath settle and condense on the stone, which it readily does. This also most frequently has some greasy qualities, and will occasion a cloudiness over that part where it has been allowed to collect, and be absorbed by the stone. Carefulness and custom will prevent this accident from occurring. A piece of clean paper kept over the part not being worked on, or the unemployed hand kept before the mouth and nostrils, will obviate it. If this should be found inconvenient, and the breath still condenses, a circular piece of card, three or four inches in diameter, having a piece of quill or feather (which is not easily bitten through) stuck through the centre, and held before the mouth by this quill, will disperse the breath without interfering with the comfort of the artist.

The stone very readily absorbs any liquid ; any gum or mucilage being put on it penetrates into the surface, and prevents any greasy matter from acting on that part. One of the processes preparatory for printing consists in giving a coat of gum to the stone, which penetrates all parts where the chalk or ink drawing is not, and preventing any farther action or accident from a greasy substance. Such being the case, should the artist, in coughing or sneezing while at work, allow any saliva, &c., to fall over his drawing, it will cause white blotches to appear in the print where they have been ; because they will so prepare the surface as to prevent his ink or chalk from having any effect. And this may not become evident until it is printed, as the chalk or ink, probably, will work the same over them.


Particles of scurf falling from the hair will also cause black specks in the print ; indeed almost everything has some effect on the stone, which should, therefore, be scrupulously kept. Should any dust accumulate on it, it is best not to blow it off with the mouth, lest any saliva should be thrown on to it. The best way is to remove anything of this sort with a large camel-hair pencil, or a hare's or cat's tail.

From these remarks it might appear that the lithographic art was surrounded with difficulties and uncertainties, but all these precautions, though very necessary to be observed, occasion no


difficulty, and the proper caution is very soon acquired. It is sufficient to mention them here.

The Drawing.

The artist, then, being ready to commence his drawing, and having the red outline traced on the surface of the stone, naturally commences with light tints. Now, the surface of the stone for the chalk drawing consists of a series of minute protuberances and hollows, forming a "tooth" for the working of the pointed crayon, it must be held as a fundamental maxim, that this grain must not be clogged up with the chalk during the progress of the work, as it can never after be satisfactorily cleared.

Having to cover a light tint, the proper mode is to cut a long and sharp point to the crayon, and holding it in the elastic holder, in a very slanting position, lay a series of parallel and short strokes, gradually swelling in the middle, thus : 

for should the work commence with any hard lines, as would be the case if the strokes commenced or ended strong, as :

 there will be considerable difficulty in getting

rid afterward of the effect they would produce on a flat tint. These lines must be *slowly*, carefully, and evenly laid ; and their fainter extremities will allow of another series of similar strokes being joined on to the end of them, without any appearance of their junction. The action of the crayon, in working on the lithographic stone, has been compared to the schoolboy, when carefully forming the body-strokes of his capital letters in his copy book. In thus laying in the first tints, care must be taken that no specks or knobs of chalk show upon the tint ; if these appear, they should be carefully picked out, with a sharp pointed etching-needle (an ordinary stout needle, fixed in a handle and well sharpened, will answer the purpose). Any neglect of this in the outset of the work cannot be remedied so well afterwards ; the object being to get rich, mellow, and even tints.

Having thus commenced the shading, these lines may be crossed, at an acute angle, by a series of others, in a similar manner, but not attempting to bring up a great effect, except by repeated and gradual cross-hatchings. It should be remembered, that when two lines cross each other, their intersection will have double the quantity of chalk to what is on the rest of the line ;

therefore, if the intervening spaces, or net-work, formed by the cross-hatching, be not carefully gone over, and all white or lighter spaces, however small, be carefully stippled up, the tint cannot print even, as these faults will be magnified in the process of preparation.

The above method of laying a tint is recommended, but as every subject requires a different handling, and each artist has some peculiar mode of working, these minutiae must, in some degree, be left to his judgment and discretion: always with this exception from ordinary crayon drawing, that the lithographer must get his effect up by *degrees*, if he requires smoothness and mellowness in his work. Dark lines and shadows are only attained by repeated working over them; and the work should, up to the last, be kept clear of any accumulation, speck, or knots of chalk, by picking them carefully away, but not by any means to injure the grain of the stone.

If the chalk should accumulate in patches or knobs, which cannot be well picked away, they may be neutralized by working around them. It cannot be too strongly insisted on, that any unevenness in the tints, where such is not intended, although it may not strike the eye in the drawing, becomes an offensive defect in the printing.

In the choice of chalks, as to hardness or softness, it is usually considered that soft chalk is by far the best; both, however, may be used. A fine point from either makes a much mellower tint than a broad one, and the crayon for the most delicate shading should be held very slanting. When greater force is required, the point may be shorter, and held more upright.

The chalk is very brittle; therefore, if it should be pressed on too hard, it inevitably breaks, and in so doing will possibly make a speck or blot, which will require some care in getting rid of. Besides this, if it is too hardly used, it will clog up the grain, and, by filling up all the minute interstices, take away all the brightness of the tint, which owes this quality to the brightness of the granulation.

Another remark respecting the crayon: if it should be used too rapidly, the friction will soften the chalk, and thus coarsen the tint, and this coarseness is increased in the printing; the most prominent specks of the grain get overloaded, and thus produce uneven specks. However free and rapidly the touches of

an experienced artist may appear, from examining the print of his works, yet the freedom and facility is owing to that education of the hand which practice ensures, and cannot be attempted by any one only conversant with the use of ordinary chalk upon paper. Every artist also makes a great difference in the appearance of the tint he produces, and in some cases this is very striking upon close examination.

If the chalk should be found to slip on the surface of the stone, during the work, the stone may be damp, or moistened with perspiration. It may be dried, but not *warmed* by the fire ; if it is warmed the work will print all of one colour. Great care should be taken that no water should touch the face of the drawing, either by the condensation of the breath, or otherwise, as it will dissolve the chalk, and choke the grain, causing, perhaps, irreparable injury.

Lights, Corrections, &c.

In the course of the execution of a drawing, it may be desirable to preserve some sharp and catching lights in the foreground, or the edges of bright clouds, &c., &c., which may be very difficult to preserve accurately and clearly throughout the drawing. These may very readily be done, by scraping them up at the conclusion of the drawing. For the purpose of taking out any broad touches from the tint, a mezzotinto scraper is the most useful tool ; a penknife, if the edge be smooth, will answer the purpose, but not so well. In scraping away any tint, great care should be taken that the surface of the stone is not seriously injured ; only sufficient force should be used to entirely remove what is wanted, without scraping the stone into hollows or ridges, which may print and prove offensive. Much of the light foliage of a foreground may be much relieved by the use of the steel etching-needle or point, and in this, also, the stone should not be cut into more deeply than is sufficient to remove the chalk.

Corrections are very difficult to make to any sort of lithographic drawing, either before or after it is printed, and they can never be done without injuring it in some degree. When it is necessary to obliterate any part of a chalk drawing, the method is to rub it out, with a small piece of lithographic stone and sand, using no water, for the reason before mentioned, that it would dissolve the chalk. If any portion should be scraped out with

the knife or scraper, the chalk will not work over it unless it is grained in a similar manner to the rest of the stone.

II. INK LITHOGRAPHY.

The principle upon which this process depends is precisely that described on pages 23, 24, and will, perhaps, be more obvious when applied to this than to the chalk lithography. The stone, of the same kind as that used for chalk, has its surface rendered perfectly level by rubbing the faces of two together, with the addition of sand, and afterwards of powdered pumice stone, or other finer grinding material. It will be found that the stone, though of a chalky nature, is susceptible of a high degree of polish, and, in its use, requires all the cautionary maxims as in chalk lithography. (See pages 27, 28.)

Lithographic Ink.

The ink used in this branch of the art is made of the same materials as the chalk, but in different proportions, and, like it, varies much in its qualities; and it should be remembered that it does not depend at all upon its *blackness* for its action upon the stone. It would act precisely in the same way if it was perfectly colourless. Therefore, the blackness or lightness of the writing or drawing is no criterion of its soundness, or of its being firmly fixed into the body of the stone.

Lithographic ink, as well as chalk, is to be procured of any lithographic printer or artists' colourman, and is made in sticks or cakes, similar to Indian ink, but is best kept in a coating of tin foil, which will effectually keep all dust and dirt from attaching to its adhesive surface. It will be far better to purchase than to make it.

In mixing this ink for use, the readiest way is to warm a *dry* colour saucer, and then rub upon its dry surface a coating of the ink, which will readily adhere to it when warm; then add sufficient *distilled* or *pure rain* water, and, with the end of the finger, rub it into the consistency of thin cream, when it will be ready for use.

It must be borne in mind that spring or ordinary river water will not do well, if it is at all hard, as, by decomposing the soap in the ink, it makes it curdly, and very unpleasant to use, and uncertain in its result. The ink, after once becoming dry, should

not be used again, but a fresh quantity made from the cake: therefore sufficient only for the day should be mixed at once, and by keeping a card over the saucer, it will prevent it evaporating, and also the admission of dust.

Pens and Pencils.

In using the ink, either a fine sable pencil, or a steel pen, may be used. The steel pen must be exceedingly fine pointed and delicate, or its markings will be coarse. Perhaps the best pens are those sold by Perry, of Red Lion Square, Bloomsbury; they are made for the purpose of lithographers, and will be found generally to be what is wished. But, of course, they require some practice in their use, when it is remembered that the operation is like writing with cream upon polished marble. But, by management and practice, these difficulties may be overcome. For straight and even lines the mathematical ruling pen is used, but its points must be made more delicate than are used for paper, as the lines it produces is rather more dependent upon the thickness of its points than upon the breadth of the opening.

For most kinds of ink drawing, the sable pencil, though a very delicate instrument, will be found, perhaps, more manageable. For this purpose, a fine pointed and very small pencil should be selected, taking very particular care that none of the hairs of the point are longer than the others. Then, as the thick nature of the ink is apt to spread the points, if the pencil is too bulky, with a very sharp penknife cut all round close to the quill a considerable portion of the hairs away, and should any be left which do not lie well with the others, or protrude at all out of the point, cut them carefully away also. Several pencils may be spoilt in this operation, but if one succeeds it is sufficient for almost all purposes.

The *tracing* is made in the same manner as described on pages 24, 25; but, in transferring it to the polished stone by means of the red paper, it will require somewhat stronger pressure on the steel point to make the red chalk come off on to the stone, than if it is grained. However, a very slight trial will tell this. In working on the stone, the bridge (page 27) to keep the hands off the surface is almost indispensable, as it will take any impressions from the warm hand or breath, or saliva, &c., as before described.

There are no particular instructions necessary for drawing in ink on the stone, as it must be supposed that the amateur has sufficient talent and practice to produce his drawing or writing upon paper with an ordinary pen and ink. Without such capability, of course, it would be useless to attempt the more difficult art of drawing upon stone. There is another point which naturally adds to the difficulty of ink lithography; and that is, that it must all be done *backwards*, or reversed from what is intended upon the print. To many this is an insuperable difficulty in writing, without great practice, and the only means of acquiring the art is by that practice. In other respects it much resembles drawing upon paper; but it should be remembered, that the ink should be sufficiently liquid to soak well into the stone, and not put on so thick as merely to look black, without taking proper hold on the surface.

For sketching in writing, &c., upon the stone, a black lead pencil may be used; but what is better, is a brass or ordinary pin, fixed in a handle, which will mark exceedingly well, without appearing so prominent and interfering as the black lead pencil.

Corrections and erasures are more easily made in this branch than they are in a grained stone. If anything is scraped out it should be done smoothly, and sufficiently deep to get to the bottom of the ink, which penetrates some depth into the surface, but no deeper, as all hollows in the stone must be carefully avoided. Larger patches, or even small pieces, may be readily and well erased by rubbing it out with a piece of snake-stone (to be procured at tool-shops) and water, taking care that the water does not smear any of the work. Any small spots can be taken out with acid, when the stone comes to be printed.

The foregoing remarks, it is believed, will be sufficient to give a clear insight to the amateur into the lithographic art. Once having acquired the necessary caution, and slight practice, the method of drawing upon stone will be found to have many advantages over that of drawing upon paper. Respecting the more elaborate works of art, as those subjects printed with a tinted background, the same principles apply, and the information necessary can be acquired from any respectable lithographic printer.

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